

-continued

Ser Gly Pro Phe Gln Gln Gln Val Gly Gly Phe Phe Ile Leu Ala Asn
145 150 155 160

Phe Gln Arg Phe Leu Glu Thr Ala Tyr Arg Ala Leu Arg His Leu Ala
165 170 175

Arg Leu

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 185 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: Not Relevant
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Thr Arg Gly Lys Leu Pro Asp Ala Pro Glu Phe Glu Lys Asp Leu Leu
1 5 10 15

Ile Gln Arg Leu Asn Trp Met Leu Trp Val Ile Asp Glu Cys Phe Arg
20 25 30

Asp Leu Cys Tyr Arg Thr Gly Ile Cys Lys Gly Ile Leu Glu Pro Ala
35 40 45

Ala Ile Phe His Leu Lys Leu Pro Ala Ile Asn Asp Thr Asp His Cys
50 55 60

Gly Leu Ile Gly Phe Asn Glu Thr Ser Cys Leu Lys Lys Leu Ala Asp
65 70 75 80

Gly Phe Phe Glu Phe Glu Val Leu Phe Lys Phe Leu Thr Thr Glu Phe
85 90 95

Gly Lys Ser Val Ile Asn Val Asp Val Met Glu Leu Leu Thr Lys Thr
100 105 110

Leu Gly Trp Asp Ile Gln Glu Glu Leu Asn Lys Leu Thr Lys Thr His
115 120 125

Tyr Ser Pro Pro Lys Phe Asp Arg Gly Leu Leu Gly Arg Leu Gln Gly
130 135 140

Leu Lys Tyr Trp Val Arg His Phe Ala Ser Phe Tyr Val Leu Ser Ala
145 150 155 160

Met Glu Lys Phe Ala Gly Gln Ala Val Arg Val Leu Asp Ser Ile Pro
165 170 175

Asp Val Thr Pro Asp Val His Asp Lys
180 185

What is claimed is:

1. An isolated or recombinant polynucleotide encoding an antigenic polypeptide comprising:

- a) at least 17 contiguous amino acids from a mature coding portion of SEQ ID NO: 2;
- b) at least 17 contiguous amino acids from a mature coding portion of SEQ ID NO: 4; or
- c) at least 17 contiguous amino acids from a mature coding portion of SEQ ID NO: 5.

2. The polynucleotide of claim 1, encoding a mature polypeptide of:

- a) SEQ ID NO: 2;
- b) SEQ ID NO: 4; or
- c) SEQ ID NO: 5.

3. The polynucleotide of claim 1, which hybridizes under stringent wash conditions of at least 65° C., less than about 150 mM salt to the complement of:

- a) the open reading frame of SEQ ID NO: 1; or
- b) the open reading frame of SEQ ID NO: 3; and
- c) encodes amino residues 155-164 of SEQ ID NO: 2.

4. The polynucleotide of claim 3, comprising:

- a) at least 67 contiguous nucleotides of a coding portion of SEQ ID NO: 1, wherein said contiguous nucleotides are from nucleotides 466-555 of SEQ ID NO: 1; or
- b) at least 67 contiguous nucleotides of a coding portion of SEQ ID NO: 3, wherein said contiguous nucleotides are from nucleotides 580-670 of SEQ ID NO: 1.

5. A recombinant or expression vector comprising said polynucleotide of claim 1.

6. An isolated host cell comprising said expression vector of claim 5.

7. A method of making an antigenic polypeptide comprising expressing said recombinant polynucleotide of claim

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1 and isolating said polypeptide, thereby making said antigenic polypeptide.

8. Said polynucleotide of claim 1, wherein said contiguous amino acids number 20.

9. Said polynucleotide of claim 1, wherein said contiguous amino acids number 30.

10. Said polynucleotide of claim 1, wherein said contiguous amino acids number 35.

11. Said polynucleotide of claim 1, wherein said contiguous amino acids number 40.

12. Said polynucleotide of claim 2, that is a variant due to the degeneracy of the genetic code.

13. The polynucleotide of claim 8, wherein said wash conditions are

- a) at least 70° C.;
- b) less than about 100 mM salt; or
- c) both a) and b).

14. The polynucleotide of claim 3, wherein said wash conditions

- a) are at least 50% formamide;
- b) are less than about 100 mM salt; or
- c) are both a) and b).

15. The polynucleotide of claim 1, that:

- a) encodes the mature polypeptide of SEQ ID NO: 2,4, or 5; or

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b) comprises the mature coding portion of SEQ ID NO: 1 or 3.

16. The polynucleotide of claim 2, wherein said polynucleotide:

a) encodes a polypeptide with a natural sequence of the mature coding portion of SEQ ID NO: 2 or 4;

b) is isolated from nature;

c) encodes a polypeptide comprising five or fewer conservative substitutions from a natural sequence of SEQ ID NO: 2 or 4;

d) encodes a polypeptide comprising five or fewer conservative substitutions from a natural sequence of SEQ ID NO: 4.

17. The polynucleotide of claim 8, which is:

- a) is attached to a solid substrate;
- b) is detectably labeled;
- c) is in a sterile composition;
- d) encodes an antigenic polypeptide having at least 12 amino acid residues; or
- e) is synthetically produced.

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